

PATENT SPECIFICATION

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(54) A BOTTLE OR SIMILAR CONTAINER WITH A DISPENSING DEVICE

(71) We, KONINKLIJKE EMBALLAGE INDUSTRIE VAN LEER B.V., a Dutch Corporate Body, of Amsterdamseweg 206, AMSTELVEEN, the Netherlands, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

10 This invention relates to bottles and similar containers for flowable materials.

The invention is concerned particularly with a bottle or similar container comprising a mouth, a flexible wall to allow flowable material to be delivered through the mouth by squeezing the bottle or container, and a dispensing device provided at the mouth and defining a chamber having a dispensing opening for discharging material from the chamber, the device including a conduit which opens at an upper end into the chamber and at the lower end near to the bottom of the bottle or container.

Such a bottle which is known is shown in Figure 1. The bottle is made of flexible material which allows the bottle to be squeezed to transfer fluid through a tube into the chamber. When the squeezing pressure is released excess fluid is sucked back leaving in the chamber of the dispensing device a predetermined amount of fluid which can be poured out through the dispensing opening.

This known dispensing device has the disadvantage that an excessive amount of fluid can easily be transferred into the chamber of the dispensing device so that chamber overflows, which, in particular in the case of expensive or very dangerous fluids, such as insecticides, can be harmful.

Another known bottle, shown in Figure 2, attempts to avoid the above-mentioned disadvantage by extending the chamber upwards and shaping the upper end to converge towards a small dispensing orifice. The contents of the chamber can be discharged by turning

the bottle upside down and squeezing the bottle again. However with this bottle, it is possible to squeeze the bottle so much that the fluid fills the chamber and sprays out through the orifice into the atmosphere.

According to the present invention there is provided a bottle or similar container for flowable material, comprising a mouth, a flexible wall to allow material to be delivered through the mouth by squeezing the bottle or container, a dispensing device located at the mouth and defining a chamber and a dispensing opening for discharging material from the chamber, the device including a conduit opening at an upper end into the chamber at a predetermined level above the bottom of the chamber and below the dispensing opening and at the lower end adjacent the bottom of the bottle or container, and means for limiting the amount by which the volume of the bottle or container can be reduced by squeezing to a value not greater than the total volume of the chamber and not smaller than the volume of the chamber up to said predetermined level.

The means may be one or more rigid inserts or profilation of the bottle walls.

With a bottle or container according to the invention, leakage due to the chamber overflowing is avoided, while it is ensured the required quantity of fluid always is obtained.

A better understanding of the invention will now be had from the following detailed description given by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a section through a known bottle equipped with a dispensing device;

Figure 2 is a section through another known bottle having a dispensing device;

Figure 3 is a section through an embodiment of the present invention;

Figure 4 is a section through another embodiment of the present invention;

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Figure 5 is a side view of the bottle shown in Figure 4;

Figure 6 is a top plan view of the bottle shown in Figures 4 and 5;

Figure 7 is a vertical section through a further embodiment of the invention; and
Figure 8 is a section taken along the line VIII-VIII in Figure 7.

Figure 1 shows a bottle 1 having a mouth 2 which receives a stopper provided with a tall cylindrical rim 4 and a central upwardly directed stem part 5.

A passage 6 in the stopper is connected to a tube 7, which extends downwardly, into the bottle and has an inlet positioned near the bottom of the bottle. Two lateral discharge openings 8 in the part 5 communicate with the passage 6.

When the bottle 1 is squeezed, fluid material flows up through the tube 7 and the passage 6 and through the openings 8 into the annular space 9 defined by the rim 4. Enough fluid is squeezed out of the bottle for the fluid level to rise above the discharge openings 8, then the bottle is released so that the excess fluid above the openings 8 is sucked back through the discharge openings 8, passage 6 and tube 7. The discharge openings 8, which are located a fixed distance above the bottom 10 in this way determine a fixed amount of fluid, which can subsequently be poured out of the chamber 9.

The bottle has the disadvantage that easily an excess of the fluid is initially supplied, and fluid can leak out of the bottle if it is turned over.

Shown in Figure 2 is a known bottle 11 with a neck 12, in which a hollow stopper 13 is fitted to be supported on the neck by a flange 14. A plug 15 including a tube 16 is inserted in the lower end of the stopper 13, and a tube 17 is connected to the lower end of the tube 16. A chamber 18 is formed by an upstanding jacket 19 of the stopper and has a small discharge opening 20. The tube 16 is shown as having an upper axial discharge opening, but it could have lateral openings, as in Figure 1.

When the bottle is squeezed, fluid is forced through the tubes 16 and 17 into the chamber 18 to partly fill the chamber. To discharge the fluid out through the opening 20, the bottle must first be expanded, and then turned over and squeezed again. The amount of fluid present in chamber 18 is then discharged through the opening 20 and the air present in the bottle.

This known bottle has the disadvantage that it is possible to squeeze the bottle so that fluid fills the chamber 18 and then leaks through the discharge opening 20.

The bottle 21 shown in Figure 3 comprises a cup 22 with a bottom 27, fitted in the bottle neck to act as a stopper. A chamber 23 is formed by the cup 22, and a screw cap 24 fitted to the mouth of the bottle. The cap 24

comprises a small discharge opening 25. A tube 26 extends through the bottom 27 of the cup 22 and terminates at its lower end close to the bottom of the bottle and at its upper end at a predetermined distance above the bottom 27 of the cup 22. On tube 26 radially extending members 28 are mounted to limit the amount the bottle can be contracted by squeezing. These member 28 can be shaped as discs, or one or more helical members could be used.

Figure 4, 5 and 6 show a bottle 30, having a flat shape, i.e. long and narrow, as viewed in horizontal section. Fitted in the neck 31 of the bottle is a stopper having a flange which abuts the upper edge of the bottle neck. The stopper has a part 32 which bears against the inner wall of the neck and a part 33 of reduced diameter which supports a rigid tube 34 which extends downwardly into the bottle. A tube 35 is connected to a central passage 36 formed in the stopper by cylindrical portion 38 upstanding from the bottom 39, and a lateral opening 37 connects the passage 36 to a chamber defined by the stopper and a cover 40. The cover 40 has an inner thread which engages an external thread on the neck of the bottle and is provided with a small discharge opening 41 closable in a known manner by a small cap 42. The lower end of tube 34 is at a greater distance above the bottom of the bottle than the lower end of tube 35.

As can be seen in Figure 6, the tube 34 has a diameter only a slightly smaller than the smaller width of the bottle. As a result the opposed, substantially flat sides only can be squeezed together a small distance. Squeezing of the bottle in the other direction is opposed by the shape of the bottle. The rigid tube 34 can be provided with openings 2 to guaranteeing uninterrupted passage of air and fluid. The lateral opening 37 in the cylindrical part 38 presents fluid being directly sprayed outwardly from the conduit 37 through the opening 41 if the bottle is squeezed abruptly, which might be possible if the discharge opening 31 were positioned coaxially with conduit 36 and opening 41.

Figure 7 and 8 show a bottle equipped with a dispensing device 43 generally similar to that shown in Figure 2. In this case the amount by which the bottle can be squeezed is limited thanks to the profiles of the opposed flat walls of the bottle. The walls, as clearly shown in Figure 8, are provided with inwardly directed ribs 44 or other formations which abut when the walls are squeezed together. To prevent a spray or jet of fluid being forced directly out through the second discharge opening 45, in the event of the bottle being squeezed too hard, a restriction 46 is provided in conduit 47. This restriction decelerates the flow of fluid when discharging fluid from the bottle into the dispensing device 43, but does not hinder the emptying of the dispensing device after turning over the bottle.

WHAT WE CLAIM IS:—

1. A bottle or similar container for flowable material, comprising a mouth, a flexible wall to allow material to be delivered through the mouth by squeezing the bottle or container, a dispensing device located at the mouth and defining a chamber and a dispensing opening for discharging material from the chamber, the device including a conduit opening at an upper end into the chamber at a predetermined level above the bottom of the chamber and below the dispensing opening and at the lower end adjacent the bottom of the bottle or container, and means for limiting the amount by which the volume of the bottle or container can be reduced by squeezing to a value not greater than the total volume of the chamber and not smaller than the volume of the chamber up to said predetermined level.
2. A bottle or container according to claim 1 wherein said means comprises one or more rigid members positioned in the bottle or container.
3. A bottle or container according to claim 2 wherein the or each said rigid member is carried by the dispensing device.
4. A bottle according to claim 3, wherein in horizontal cross-section the bottle is generally rectangular with a length substantially greater than the width, and a single rigid member is provided and forms an extension to the dispensing device.
5. A bottle or container according to claim 1, wherein said means comprises formations on the bottle or container walls.
6. A bottle or container according to claim 5, wherein a wall of the bottle or container is configured to form inwardly directed projections for engaging an opposed wall to limit the extent to which the bottle can be squeezed.
7. A bottle or other similar container, substantially as herein described with reference to Figure 3, Figures 4 to 6, or Figures 7 and 8 of the accompanying drawings.
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COMPLETE SPECIFICATION

3 SHEETS

This drawing is a reproduction of
the Original on a reduced scale
Sheet 1

fig-1

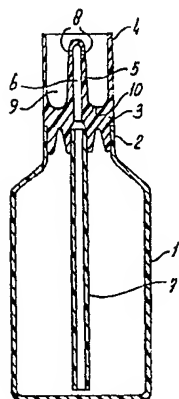


fig-3

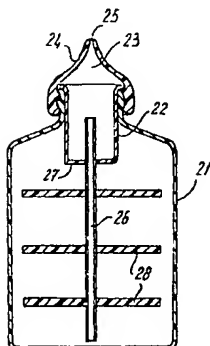
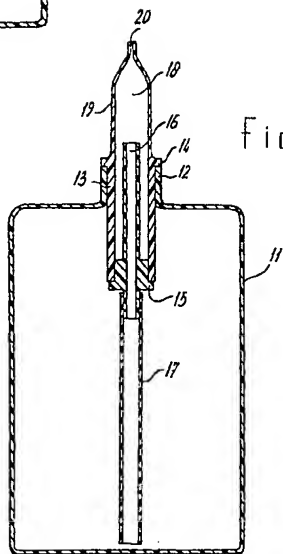


fig-2



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COMPLETE SPECIFICATION

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Sheet 2

fig-4

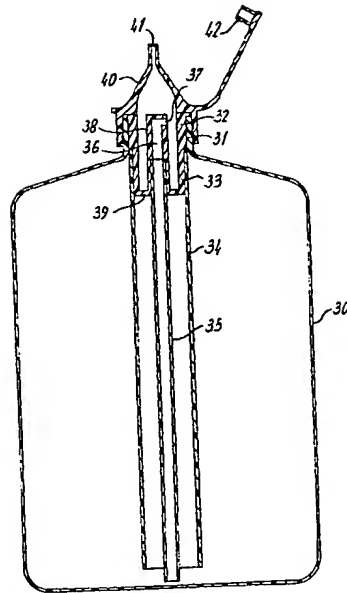


fig-5

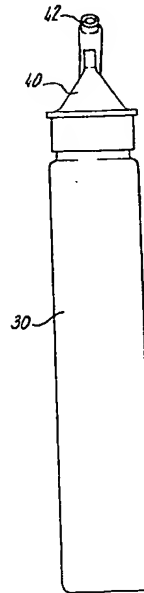
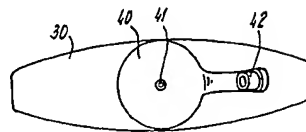


fig-6



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COMPLETE SPECIFICATION

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*This drawing is a reproduction of
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Sheet 3

fig-7

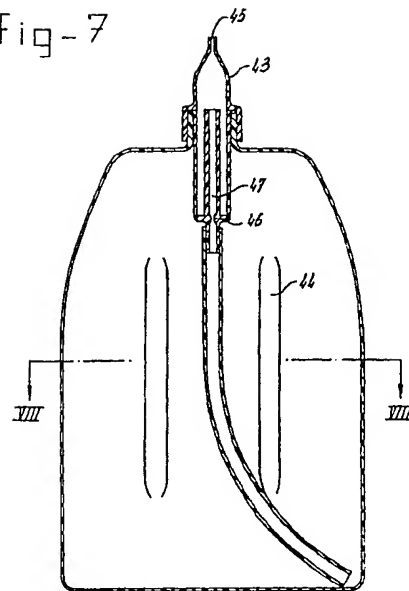


fig-8

